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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,603	02/22/2002	Ming Yan	LWM-A078	5733

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EXAMINER

PAK, SUNG H

ART UNIT PAPER NUMBER

2874

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/082,603	<b>Applicant(s)</b> YAN ET AL.	
	<b>Examiner</b> Sung H. Pak	<b>Art Unit</b> 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-15 and 18-20 is/are allowed.
- 6) ☒ Claim(s) 16 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendment filed 6/01/2006 has been entered. All pending claims have been carefully reconsidered in view of the amendment, and the accompanying arguments for patentability. After a careful reconsideration, applicant's arguments regarding the patentability of claims 1-15 and 18-20 are convincing, and these claims are deemed allowable. However, the examiner respectfully submits claims 16-17 remain unpatentable, and the ground of rejection provided in the previous office action for claims 16-17 is maintained in this office action.

### ***Response to Arguments***

Applicant's arguments filed 6/01/2006, with respect to claims 16-17 have been fully considered but they are not persuasive.

It is respectfully submitted that pending claims 16-17 of the present application contain "product-by-process" limitations, wherein the "product" claim is limited by the process of manufacturing the product (i.e. "...refractive index adjusted in accordance...", "... optical path length is controlled to...", etc.).

As stated in MPEP §2113, "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777

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F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). As such, while the product-by-process limitations are not ignored, such limitations are not given patentable weight unless such limitations inherently impart definite structural features and configurations to the claimed product that distinguishes the claimed product over the prior art.

In addition, it is respectfully noted that it would be improper to import specific limitations from the specification into the claims when interpreting product-by-process limitations (which is true also for any other types of claim limitations). See MPEP §2111. Thus, the pending claims must be given their broadest reasonable interpretation consistent with the specification, without importing limitations from the specification into the claims.

Based on this premise, the examiner respectfully submits that the structure resulting from the product-by-process limitation of claims 16-17, in conjunction with the rest of explicitly recited structures are rendered obvious as discussed in the previous office action. Although the applicant argues that “neither Yamada or Chen teach the concept of controlling the optical path length using a laser to change the index of refraction while achieving the control of the optical path length with 10 nanometers through control of index of refraction” (page 7, first full paragraph), claims 16-17 are NOT limited by such process (even assuming, *arguendo*, applicant’s assertion is true), and the structure implied by the process is fully rendered obvious by the cited prior art as presented in the previous office action.

Therefore, the examiner respectfully submits that the ground of rejection provided in the previous office action is proper.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicants are advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (US 5,940,548) in view of Chen et al (US 6,356,681).

Yamada reference discloses a method of optimizing a filter response of an arrayed waveguide grating with all the limitations set forth in the claims, except it does not explicitly teach the optical path length of the waveguides being controlled to within ten nanometers.

Specifically, Yamada disclose the steps of: measuring a respective phase error of a plurality of waveguide cores of an arrayed waveguide grating using a low coherent light interferometry (column 14 lines 34-41); adjusting a respective optical path length of the cores in

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accordance with the respective phase error of the cores by adjusting a respective refractive index of the cores, thereby optimizing a filter response of the arrayed waveguide grating (column 14 lines 42-44);

wherein the respective refractive index is adjusted by using laser energy (column 14 lines 42-44);

wherein the adjusting of the refractive index of the cores is used to equalize channel power of the arrayed waveguide grating (column 14 lines 34-44: specifically lines 34-44 states, inter alia, “measure... the distribution of amplitude errors... Based on these measurements, determine the amount of amplitude adjustment...”);

wherein the adjusting of the refractive index of the cores is used to compensate for dispersion within the arrayed waveguide grating (column 14 lines 34-44: specifically lines 34-44 states, inter alia, “measure the distribution of phase errors... Irradiate each arrayed waveguide with laser light to ... compensate for the phase error.” The phase error causes dispersion within the waveguide and the compensation of phase error compensates dispersion);

wherein the refractive index of the cores is adjusted within a grating area of the arrayed waveguide grating by using laser energy (column 14 lines 34-44).

Yamada also discloses an arrayed waveguide grating thus optimized with the above methods.

On the other hand, Chen reference explicitly discloses a method of controlling the optical path length of a waveguide via ultra short laser pulses to within ten nanometers (column 1 lines 55-67: Chen explicitly discloses controlling the path lengths within 1 picometer precision, which

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is certainly less than ten nanometers). Such arrangement is considered advantageous and desirable in the art, because it allows for highly precise optical device capable of high bandwidth optical communications having very close channel separation. (see also, column 1 lines 11-53 for advantages). Thus, the overall operating efficiency is significantly increased by having the optical path length controlled to within nanometer scale.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yamada method to control the optical path length to within ten nanometers. It would be desirable to have an efficient, high fidelity optical device.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (US 5,940,548) and Chen et al (US 6,356,681).

Yamada in view of Chen render all the recited limitations obvious, as discussed above, *except* they do not explicitly disclose: measuring of phase errors within nanometer resolution (claims 3, and 11); or the use of ultraviolet laser energy (claims 5, 13, and 17).

However, as discussed in the previous office action and maintained in the present office action, measuring of phase errors within nanometer is well known and common in the art. Nanometer resolution is considered advantageous and desirable in the art because it allows for accurate and precise adjustment of phase error, which is desirable in building reliable optical communications device. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Yamada device to have nanometer resolution phase error measurement.

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Also, as discussed in the previous office action and maintained in the present office action, the use of ultraviolet laser in changing refractive indexes of optical waveguides is well known and common in the art. The use of ultraviolet laser is considered advantageous and desirable in the art because it provides a simple, reliable and low cost means of modifying refractive indexes of optical waveguides without having to impart structural changes to the waveguides. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Yamada device to use the ultraviolet laser.

***Allowable Subject Matter***

Claims 1-15, 18-20 are allowed.

These claims are allowed for reasons provided in the applicant's response filed 6/01/2006.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,



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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571)272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Sung H. Pak  
Primary Patent Examiner  
Art Unit 2874